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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,396	06/06/2000	Richard F. Buckley	19546-020-(E-3915)	9558

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MINTZ, LEVIN, COHN, FERRIS, GLOVSKY  
AND POPEO, P.C.  
ONE FINANCIAL CENTER  
BOSTON, MA 02111

EXAMINER
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TRAN, KHOA H

ART UNIT	PAPER NUMBER
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3634

DATE MAILED: 02/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/588,396

Applicant(s)

BUCKLEY, RICHARD F.

Examiner

Khoan Tran

Art Unit

3634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

***Claim Objections***

Claims 14, 18, 22, and 23 are objected to because of the following informalities:

Claim 14, line 7, "wafer is in contact, and which supports" should be changed to --wafer will be in contact and which will support--. Claim 18, lines 2 and 4, "form" should be changed to --from--. Claim 22, line 5, "a first and a second upper support guides" should be changed to --first and second upper support guides--, and line 9, "by" should be changed to --along--. Claim 23, line 7, "the lower horizontal grooved portion contacting" should be changed to --the lower horizontal grooved portion adapted to contact--, and lines 10-11, "wafer is supported" should be changed to --wafer will be supported--. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sibley ('230). Sibley ('230) discloses a silicon carbide semiconductor wafer carrier (70), see Figure 5, including processes that require the use of high temperatures, see the abstract and column 1, lines 8-11, column 2, lines 8-9, and column 3, lines 24-25. The semiconductor wafer boat (70) of Sibley comprising a plurality semiconductor wafers,

(only one showed, see Figure 5), receiving in a plurality of slots position between first and second ends of the boat. The plurality of slots (75) on the wafer boat are located on a first (left side) and second (right side) upper supporting guide and on a lower arc grooved portion (74), the lower arc groove portion defined by an arcuate or a generally concave contour as viewed along a central axis from a bottom of supporting surface of the wafer carrier, see Figure 5, and column 5, lines 48-50, and the at least one window (32) displaced on the carrier positions substantially in a small distance in from the distal end of the boat. The process of making the wafer boat is through a process of involving high heating through a suitable temperature. See columns 7 and 8. With respect to claim 16, to one of ordinary skill in the art, it would have been obvious that the silicon carbide would recrystallized itself to a normal state when place in a cooler environment after being removed from the high temperature environment. With respect to the dimensioning of the wafer and the angle of the wafer relatives to the boat, and the length of the arc groove and the distance of the windows locate from the distal ends of the boat, it would have been an obvious matter of engineering design choice as determined through routine experimentation and optimization for one of ordinary skill in the art to routinely dimension the wafer to have a diameter of about 300mm and the thickness of 5mm, and dimension the radius angle from the center to the periphery edge of the wafer relatives to the upper supporting guides to be in ranges of 10-80 degrees, and dimension the arc length to be 20mm for a particular application, producing no new and unexpected results. With respect to claim 20 it would have been obvious to one of ordinary skill in the art as a matter of design choice to make duplication in part of the

number of slots on the wafer boat in order to accompany the desire number of semiconductor wafers for a particular application thus producing no new matters. It should be noted that the applicant's drawings do not show the boat must support 25 wafers. Further, it is not the main inventive concept of the applicant to have a wafer boat design to hold only 25 wafers, see page 12, lines 19-20. With respect to the range of temperatures approximately between 1000 to 1400 degrees of Celsius, it should be noted, the patentability of the reciting structure, itself, that is to be determined and not how the product is to be constructed or the processes of the product arrive, Sibley ('230) discloses the process of making the wafer boat through a high suitable temperature, i.e., 2000 degrees Celsius, see column 8, lines 31-32. Sibley ('230) does not specifically disclose the temperature is to be in ranges of between 1000 to 1400 degrees of Celsius. However, it is well established by case law that it is not inventive to discover the optimum or workable ranges where the general conditions are known in the art. Further, it is expected, as a part of the level of skill would routinely experiment to discover the optimum or workable ranges for a particular use. Accordingly, it would have been an obvious matter of engineering design choice, as determined through routine experimentation and optimization, for one of ordinary skill in the art to dimension the process temperature to be in ranges between 1000 to 1400 degrees Celsius, thus producing no new and unexpected results.

***Response to Amendment***

Applicant's arguments filed October 28, 2003 have been fully considered but they are not persuasive.

With respect to applicant's arguments that Sibley fails to teach or suggest a generally concave contour as viewed along the central axis of the wafer, the examiner respectfully disagrees. It should be noted that the wafer carrier of Sibley illustrates a lower arc groove portion defined by an arcuate or a generally concave contour as viewed along a central axis from a bottom of supporting surface of the wafer carrier. The general recitation of a concave contour as viewed "a long a central axis of the wafer" in claim 14 fails to serve a patentably distinguish feature over the prior art since there is no distinction in the claim that would preclude the arc of Sibley not to be consider as a concave arc, in particular applicants fail to set forth which direction the concave contour is defined from the carrier and with respect to where the central axis is defined relatively from the carrier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khoa Tran whose telephone number is (703) 306-3437. The examiner can normally be reached on Monday through Thursday from 9:30 A.M. to 7:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola, can be reached on (703) 308-2686. The fax phone number for this Group before a final Office action is (703) 872-9306 and after a final Office action is (703) 872-9327.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2168.

Khoa Tran

January 23, 2004

A handwritten signature in black ink, reading "Daniel P. Stodola". The signature is written in a cursive style with a large, looped initial "D".

DANIEL P. STODOLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600